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ABSTRACT

Underachievers (N = 649) were defined to be those in a sample of 6,729 high school students whose grades were in the lowest 15 percent relative to what one would predict on the basis of standardized tests of mental performance. They were compared on demographic and personal-social variables during high school and educational and occupational attainment 13 years after high school with students who had the same mental ability but appropriate grades and with students who had the same grades but appropriate mental ability. During high school, underachievers as a group were essentially identical to students who got the same grades, not to those who had the same mental ability, with respect to a variety of demographic and personal-social factors. Similarly, in the 13 years following high school, underachievers pursued further schooling and took jobs consistent with their grades, not with their abilities. In fact, underachievers had a substantially lower likelihood of completing four years of college and a greater likelihood of divorce than did non-underachieving students matched either for grades or ability. Some underachievers ultimately did catch up to their abilities--those who, as high school students, had high educational and occupational expectancies, who had high self-esteem and perceived competence, who participated in activities (especially females), and whose parents were well educated. But not all such underachievers caught up. For example, serious underachievers of medium and high mental ability did not catch up. They attained very little relative to other groups. Students from less educated families were less likely to achieve levels commensurate with their ability than students from better educated families. (Author/KC)

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The Adult Educational and Occupational Status
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Executive Summary

Underachievers ($N = 649$) were defined to be those in a sample of 6,729 high school students whose grades were in the lowest 15% relative to what one would predict on the basis of standardized tests of mental performance. They were compared on demographic and personal-social variables during high school and educational and occupational attainment 13 years after high school with students who had the same mental ability (Same MA) but appropriate grades and with students who had the same grades (Same GPA) but appropriate mental ability.

During high school, Underachievers as a group were essentially identical to students who got the same grades, not to those who had the same mental ability, with respect to a variety of demographic and personal-social factors. Similarly, in the 13 years following high school, underachievers pursued further schooling and took jobs consistent with their grades, not with their abilities. In fact, Underachievers had a substantially lower likelihood of completing four years of college and a greater likelihood of divorce than did non-underachieving students matched either for grades or ability.

Some Underachievers ultimately did catch up to their abilities--those who, as high school students, had high educational and occupational expectancies, who had high self-esteem and perceived competence, who participated in activities (especially females), and whose parents were well educated. But not all such Underachievers caught up. For example, serious Underachievers of medium and high mental ability do not catch up. They attained very little relative to other groups. And students from less educated families are less likely to achieve levels commensurate with their ability than students from better educated families. Diamonds in the rough tend to stay in the rough.

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School underachievers are students who perform more poorly (i.e., have poorer grades) than one would expect on the basis of their abilities (i.e., tests of aptitude and educational achievement). School underachievement became a prominent issue three decades ago when interest focused on intellectually gifted students, many of whom were found to perform rather poorly in school relative to their ability.

Today, concern is directed at low achievement in general, especially students at risk for dropping out of school and those who have learning disabilities and other identifiable problems. While these groups include underachievers, the definition of underachievement usually rests on a performance-ability discrepancy that is not associated with an identifiable disorder or disability. Instead, poor performance is often attributed to motivational, family, personal, and social factors.

Whatever the cause, underachievers often worry and frustrate their parents, those who do not have identifiable disabilities may not be detected or be eligible for special services, and those from poor educational backgrounds may not be identified as being more capable than they appear and not receive the educational encouragement they deserve.

Upper middle-class underachievers, at least, are often assumed to come alive educationally once they mature or leave the family home. But do they? Are underachievers any different from other young people who get low grades

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even though underachievers have more ability? Do they achieve educational and occupational levels as adults that are consistent with their abilities rather than with their high school grades? Can we predict those underachievers who will "recover" in this way?

These were the focal questions of the current research project. This study is unique in the literature because it involves 1) large samples of high school underachievers, 2) underachieving students across the entire range of mental ability, 3) comparison groups that control for grades and for mental ability, 4) extensive educational and personal-social information obtained in an objective way during high school, and 5) educational and occupational follow-up information collected 13 years after high school on more than 98.2% of the total original sample.

Method

Sample

Total sample. The original sample consisted of 6,729 students from a proportional, stratified random sample of high schools in the state of Washington. They were studied by Gordon McCloskey, Walter Slocum and William Rushing (Slocum & Bowles, 1966) predominantly in their junior and senior years. Students completed one of two extensive questionnaires regarding their educational experience, personal and social factors, peer and family relations, educational and occupational aspirations and expectations, and demographics. Achievement test scores and grades were obtained from school records. Thirteen years later, Otto, Call, and Spenner (1981) interviewed 98.2% of this sample regarding their personal, educational, and occupational status and history. Details of the sample and assessments can be found in these references; no new assessments were conducted for the current project.

Defining underachievers. High school grade point averages were standardized within schools and then regressed on a composite mental ability index (a standardized scale of scores on a variety of mental aptitude-achievement tests that intercorrelated approximately .75). Underachievers were defined to be those students whose residual standardized grade average was less than one standard error below the value predicted by their mental ability index, which constituted approximately the bottom 15% ($N = 649$) of students in this regard. Note that students who today might be regarded as having learning disabilities or other identifiable problems are included in the Underachievement Group in this study.

Comparison groups. Two major comparison groups were constructed. The first, the Same Grades Group (Same GPA) controlled for grades but not for mental ability. Specifically, these students were selected to have the same grades as the Underachievers but mental ability scores that were much closer to what would be expected on the basis of their abilities. Generally, they came from the 15% of students who clustered most closely about the regression line of grades on mental ability. This group ($N = 272$) represented students who received the same grades as the Underachievers but who were not underachieving.

The Same Mental Ability Group (Same MA) controlled for mental ability but not for grades. Specifically, these students were selected to have mental abilities that were comparable to the Underachievers but grades that were closer to what would be expected on the basis of their tested ability. Generally, they came from the 15% of students clustered most closely about the regression line of grades on mental ability. These students ($N = 568$) were what the Underachievers would have been if they had obtained grades more closely associated with their actual mental ability.

Selected Underachievers. Since the definition of underachievement involves a disparity between grades and mental ability, certain biases are likely. For example, a disproportionate number of poorly performing students will be Underachievers, leaving fewer such students for the comparison groups. While the Same GPA and Same MA groups were well matched to the Underachievers with respect to grades and mental ability respectively, the matching was not perfect. Rather than eliminating comparison subjects to make the match more precise which would bias the representativeness of the comparison groups, special groups of Underachievers, designated Selected Underachievers, included only those Underachievers to whom a comparison subject had been matched. Separate Selected Underachievers groups were matched with the Same GPA and Same MA groups. A difference between Underachievers and a comparison group is reported here only if the difference was present when the unselected Underachievers and the Selected Underachievers were both significantly different from the comparison group.

Overachievers were also identified, but their results are not reported in this summary.

Analysis Procedures

Questionnaire forms. Approximately half the total sample was given one questionnaire in high school and the other half was given another questionnaire, called Form A and Form B. While some questions were on both forms, many items appeared on only one of the two forms. Therefore, most analyses compared Underachievers with the two comparison groups separately for males and females and separately for Form A and B.

Statistical comparisons. Generally, the analyses began with a four-group analysis of variance comparing Underachievers, Same GPA, Same MA, and Overachievers. This was followed by pair-wise comparisons between the Underachievers and each of the comparison groups. Then pair-wise comparisons were conducted between the Selected Underachievers and each of the comparison groups. The analysis of variance and simple effects tests were conducted for metric variables while analogous chi square comparisons were performed for categorical variables. Generally, multivariate analyses were precluded, because the amount of missing data reduced the sample size drastically if four or more variables were included in a single analysis.

Results

Underachievers

Underachievers did not differ in average mental ability or grade average relative to the sample as a whole. This means that the Underachievers were indeed drawn from across the entire range of ability and grades.

Sex ratio. The definition of underachievement used in this study produced approximately two male Underachievers for every female. Although this study is unusual in having a large sample and in defining underachievement across the entire range of abilities, this 2:1 male-female sex ratio is roughly comparable to proportions found in more selected samples.

Counselor identification. For a subsample in one form, school counselors were asked whether they felt particular students were overachievers, underachievers, or performed about average for their abilities. Counselors correctly identified only half of the Underachievers (and only 33% of male and 10.5% of female Overachievers). It is possible that in the eyes of school personnel, students are underachievers only if their abilities are clearly displayed in language, interests, and perhaps family background; a student who tests very well but has few other obvious signs of ability is not so identified. If this is true, then rotten apples are detected more readily than diamonds in the rough, and a major function of aptitude-achievement tests--that is, detecting ability that is not readily apparent--is largely absent.

Syndromes of underachievement. An attempt was made to discern major types of Underachievers (e.g., the social-activity student too busy with interests other than academic, the rebellious student, the shy student lacking self-confidence, etc.). Underachievers were clustered on a small set of variables relevant to these syndromes often hypothesized clinically, but the analyses did not produce a few, clearly interpretable groups or syndromes. While this failure might reflect variables irrelevant to underachievement, the clinical literature reports Underachievers to have a great many diverse characteristics. So it is possible that Underachievers do not fall into a few clear syndromes or types.

Group Differences in High School Behavior

The first set of analyses was aimed at determining the variables assessed during high school that discriminated between Underachievers and the comparison groups. Analyses were conducted separately for 30 metric variables and 25 categorical variables for Form A and 28 metric and 23 categorical variables for Form B.

Underachievers versus Same MA. When viewed across Form and Sex, Underachievers differed from the Same MA comparison group by having lower future educational and occupational aspirations and expectations and lower perceptions of current and future educational abilities, general competence,

and self-esteem. The most notable sex difference was that Underachieving girls differed from Same MA controls along a social dimension involving both peers and parents. For example, Underachieving girls had more friends but ones who had a lower value for education and participated in fewer activities. They also felt their parents had lower estimates of their abilities and performance.

Some variables that did not discriminate between Underachievers and Same MA controls were notable because they are often mentioned as factors in underachievement when gifted students are studied. For example, Underachievers (defined in this study across the entire range of abilities) were not predominately upper- or middle-class, white, later-borns (e.g., separating themselves from their achieving siblings), or in extreme relationships with their parents. Neither did their parents divorce at higher rates nor were mother's of Underachievers of either sex more likely to work outside the home. Such factors may still be relevant to underachievement, but this observation indicates they are not uniformly involved in the same way for substantial numbers of Underachievers.

Underachievers versus Same GPA. When Underachievers were compared with students who had the same grades but lower mental abilities (Same GPA), essentially no consistent differences were observed. This means that regardless of their mental ability, Underachievers were imperceptible from less capable students who obtained the same grades in high school, at least with respect to the measures available in this study. This was true even for low self-esteem and external locus of control, variables frequently mentioned as characteristics of Underachievers.

Conclusion. Therefore, in terms of the variables assessed during the high school period, Underachievers were no different from other students who obtained comparable grades. Stated other ways, grades are everything during high school and mental ability is nothing, or no obvious special personal-social characteristics are associated with underachievement per se that are not also associated with low grades.

Group Differences in Educational and Occupational Outcome

First job. The status and income of male and female students' first jobs paralleled their grades not their mental ability. Specifically, Underachievers had lower status and lower paying jobs than the Same MA controls, but Underachievers were not different in this regard from the Same GPA comparison subjects. Therefore, Underachievers took a first job commensurate in status and income with their underachieving grades, not their more advanced mental ability.

Long-term general educational and occupational outcome. The results of analyses on attained education and occupation 13 years after high school were similar to those for first job. That is, both male and female Underachievers completed years of education and held jobs with income and status that were consistent with their high school grades rather than with their mental abilities. The results are presented in Table 1.

Specifically, Underachieving males completed 1.63 years of formal education less (10.5%), earned \$.76 per hour less (7.7%) and had substantially lower status jobs than if they had not been Underachievers (i.e., if they had the same ability but achieved appropriate grades during high school). Similarly, Underachieving females completed 1.05 years of education less (7.4%), earned \$.73 per hour less (12.2%), and held substantially lower status jobs than if they had not been Underachievers (i.e., if they had performed in high school at levels appropriate to their abilities).

Further, this pattern of differences persisted for both sexes even when the status and income of the first job following high school was covaried, indicating that not only did Underachievers start at a disadvantage relative to their ability but they did not progress educationally and occupationally as rapidly as if they had not been Underachievers.

In contrast to the above results, no consistent differences for either sex were observed between Underachievers and students who got comparable grades but had lower mental ability scores in high school (i.e., Underachievers versus Same GPA). In terms of general long-term educational and occupational success, then, grades are everything.

Type of post-secondary school. Relative to the Same MA group, male Underachievers were almost twice as likely to go to a vocational or technical school, more than one-third as likely to attend a professional school, about as likely to attend a junior or community college, but only half as likely to attend a college or university. Further, of those who did attend a college or university, twice as many Underachievers dropped out and only half as many graduated. Also, Underachievers were 50% more likely to enter the military.

The results were similar for females, but the magnitudes of the differences were not as great partly because of the generally higher or lower percentages of girls in various categories. Specifically, relative to the Same MA group, Underachieving girls were 57% more likely to go to vocational or technical school, about as likely to go to a junior or community college, but only 42% as likely to attend a college or university. Of those who did attend a college or university, Underachieving girls were 42% more likely to drop out before graduation.

In contrast to these comparisons with the Same MA group, no differences existed between Underachievers and those students who had the same grades but lower mental abilities (i.e., Same GPA). Therefore, the distribution of attendance at different types of post-secondary schools was almost totally associated with high school grades rather than with mental ability.

Completing college. Thus far, Underachievers, although brighter, attained the same levels of education and job status as students who performed equivalently in high school. However, when the data are considered in terms of the likelihood of completing four years of college, the unique attributes of underachievement emerged. Specifically, as presented in Table 2, the Underachiever had only a 20.4% chance of completing four years of college, the student who had the same grades but lower mental ability (Same GPA) had a

27.1% chance, and the student with the same mental ability but better and more appropriate grades (Same MA) had a 51.5% chance of completing college. The trends were comparable for both sexes. In this case, when grades are controlled, non-underachievers (Same GPA) have a one-third better chance of completing college than do Underachievers.

Divorce. A similar effect for underachievement per se occurred with respect to marital stability. As presented in Table 3, Underachievers were at least 50% more likely to divorce in the 13 years following high school than either of the comparison groups. The relative trend was similar for males and for females, but divorce rates were generally higher for females. Specifically, 51.4% of the Underachieving females divorced compared to 34.2% of the Same GPA and 28% of the Same MA females. Therefore, Underachievers are substantially more likely to divorce than either students who had the same mental ability or students who had the same grades.

Moderators of Educational and Occupational Outcome for Underachievers

Naturally, some Underachievers ultimately accomplished more educationally and occupationally than others. For the most part, grades in high school were the main predictors of educational and occupational outcome, but individual differences persisted even after grades were partialled out.

Predictors of outcomes. Generally speaking, comprehensive correlational and partial correlational analyses within the Underachiever group revealed that the most consistent and strongest predictors of years of education were the educational expectations of the high school student and the educational level of his or her parents. For females, these predictors were supplemented by the number of activities or the perception of their ability to complete college.

Adult job status was predicted best by educational or occupational aspirations, but the level of prediction was more modest for females than for males.

Predictions to income were low and inconsistent for both sexes.

Individual differences on several variables frequently mentioned as characteristics of Underachievers did not predict relative outcome. For example, the partial correlations (with grades covaried) for self-esteem ranged between -.12 and .15. Also, partial correlations for locus of control and variables reflecting the closeness of the student-parent relationship were not consistently significant. Even self assessments of general competence, school ability, and interest in school work produced only modest partial correlations (.15 to .20) with years of education.

This is not to say that self-esteem, locus of control, and relationship to parents, among other factors, are irrelevant to later achievement. Specific analyses directed at these variables showed that they were correlated

with educational and occupational attainment, but partialing out grades reduced the strength of the predictive relation and they accounted for far less variance than did the primary predictors described above (i.e., educational expectations, mid-parent education). Therefore, they are part of a set of correlated variables--albeit not the primary members--that predict differences in outcome for Underachievers.

Underachievers, then, who have a high value for education, as reflected in well-educated parents and personal expectations of going to college and having a good job, and who participate in activities, are reasonably self-confident, and have good self-esteem do relatively better educationally and occupationally in the 13 years following high school than do other Underachievers, and this is true even after the predictive significance of high school grades is extracted.

Do Some Underachievers Catch Up to Their Ability?

Such students may do relatively better, but do they actually catch up to levels of achievement that they might have attained if they had not been Underachievers in high school? As a group, Underachievers do not, but do any Underachievers attain levels commensurate with their ability, and if so, who are they?

Years of education. In the section above, educational expectations and mid-parent education were shown to predict years of education for male Underachievers, so the most likely Underachieving males to completely recover educationally would be those who had high educational expectations and high mid-parent education. Therefore, Underachieving males in Form A who had the highest levels of educational expectations and who came from the most educated families (approximately the top 25-30% on each predictor) were compared with respect to their years of attained education to the Same MA group which was similarly divided according to educational expectations and mid-parent education. The results, depicted in Figure 1, indicated that such Underachievers ultimately attained as many years of education as they would have if they had not been Underachievers. They did recover and catch up educationally.

Correspondingly, the best predictors of years of education for Form A females were mid-parent education and number of activities, and again those females who were highest on these two characteristics did indeed attain as many years of education as those females who had the same mental ability who were not Underachievers (i.e., Same MA). The results are presented in Figure 2.

Unfortunately, the results for Form B males and females did not confirm these findings for years of education (Figures 3 and 4). Specifically, males and females who were highest on the set of best predictors of educational outcome did relatively better (as has already been demonstrated), but they did not catch up completely to students who had the same mental ability but who were not Underachievers.

Job status. When predicting job status, the results for males were more consistent across the two Forms (Figures 5 and 6). Specifically, Underachievers who had high educational expectations (Form A) or who had high occupational aspirations and participated in a great many school activities (Form B) obtained jobs with social status comparable to those students who had the same mental ability but who were not Underachievers. Further, such Underachievers were better than students who obtained the same grades but who had lower mental ability.

Since the predictors to job status for females were much weaker than for males, it is not surprising to find that such Underachieving females do not completely recover with respect to job status (Figure 7; no predictors for Form B). Similarly, the predictors for job income were so poor that no recovery in this regard could be documented.

Conclusion. Underachievers who have a high value for education, are in a number of activities, perceive themselves capable of completing college, and have parents who are well educated do achieve more educational and occupational success than other Underachievers, and some of them attain as much as they would have if they had not been Underachievers in high school. But such factors do not always lead to "complete" recovery.

Other Predictors

Degree of underachievement. Another possible predictor of outcome is the degree of underachievement. While Underachievers as a group are defined by a minimum negative residual between actual and expected grade level, substantial variations exist with respect to how badly the Underachieving student performs relative to expectancies.

Correlations were computed between the degree of underachievement and the outcome variables, controlling for grade average. In no case did any consistent relation exist across forms between the degree of underachievement and outcome.

Mental ability. Underachievers also differed in mental ability, because this study defined underachievement across the entire range of ability measures. Correlations were calculated between mental ability and the outcome measures controlling for grade average. No consistent partial correlations were found.

Degree of underachievement and mental ability. The results above are partly deceiving, because when the degree of underachievement and mental ability are viewed together, predictions do emerge. For males and females in Forms A and B, serious Underachievers achieve fewer years of education than either comparison group, but this is only true for Underachievers of medium and high ability levels. The same effect occurred for job status for males, but not for females. The results are presented in Figures 8-10. Viewed another way, ability level makes no difference at all for serious Underachievers, and high ability serious Underachievers are at the most disadvantage relative to what they would have attained if they had not been

Underachievers. Some--namely serious Underachievers of medium and high ability--do not catch up at all.

Conclusion

During high school, underachievers are essentially identical as a group to non-underachieving students who have the same grades but lower mental ability. Underachievers are not similar to students who have the same mental ability and who are achieving appropriate grades for that ability. Therefore, grades--not ability--is the major correlate of the high school behaviors examined here.

Generally, this theme persists in the 13 years following high school, and underachievers as a group attain approximately the same adult educational and occupational outcomes as do students who had the same grades but who were not underachievers in high school. As a group, then, they do not recover or catch up to their abilities.

In fact, underachievers have a substantially lower likelihood of completing four years of college and a much higher divorce rate (especially for females) than non-underachievers matched either for grades or ability. Therefore, the unique characteristics of underachievement show up in failure to complete college and higher divorce rates.

But underachievers who have high educational expectations, who have parents who are highly educated, and (to a lesser extent) who have high perceived competence and participate more in activities (females) do relatively better educationally and occupationally than other underachievers. Moreover, some of these underachievers ultimately attain as many years of education and jobs with as high status as they would have if they had not been high school underachievers.

Specifically, those psychological variables may focus on a value for education and achievement that exists in high school but is not then accompanied by the discipline and motivation to achieve. Such students expect much of themselves, partly as a result of living in a family that values education, and they enjoy the benefits of their parents' high job, social, and economic status. But they do not produce in school because of motivational factors and other personal-social characteristics. Such factors might be competing interests (e.g., they are more interested in sports, interpersonal relations, heterosexual relations, or "fooling around"), temporary strivings for independence, and rejections of parental values (e.g., especially for doing school work). Once the student leaves the family and must create a life for him- or herself, many such young people achieve.

However, not all underachievers "recover." The fact that underachievers did poorly in terms of completing college and maintaining a stable marital relationship indicates that at least some underachievers learn to quit in the face of challenge and frustration and lack the motivation to establish and achieve appropriate goals for their abilities. And serious underachievers of

medium and high mental ability do not attain any more than their low mental ability underachieving peers. They definitely do not catch up.

It is possible that the difference between overcoming and not overcoming chronic high school underachievement depends on having real success experiences in some domain--academic, intellectual, athletic, artistic, or social. The psychological benefits of such successes may be partly reflected during high school in educational expectations and aspirations, participation in activities, and perceived competence. But ultimate success may also depend on being perceived by others as competent. Underachievers from less educated homes did not catch up to their abilities, perhaps as a result of having parents and teachers who did not recognize their ability, expect it to flower, and encourage them to achieve their potential. The diamond in the rough appears to stay in the rough.

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Table 1

Long-Term Educational and Occupational Follow-Up as a Function of Group
(Form A and B)

	Under- achiever (N=390)	Same MA (N=319)	Over- achiever (N=145)	Same GPA (N=131)
<u>Males</u>				
Years of Education	13.96	***15.59***	***16.27***	14.34*
Income	9.06	**9.82*	***10.85***	9.65
Status	41.65	***54.40***	***60.99***	45.45
<u>Females</u>				
Years of Education	13.18	***14.23***	***15.14***	13.38
Income	5.27	6.00	**6.22**	5.21
Status	44.83	***53.94***	***57.83***	45.91

All four-group chi squares, $p < .0001$.

Asterisks following a percentage is significance level for pair-wise comparison with Underachievers.

Asterisks preceding a percentage is significance level for pair-wise comparison with Selected Underachievers.

*, **, *** = $p < .05, .01, .001$, respectively.

Table 2. Estimated Likelihood of Completing Four Years of College
(Forms A and B)

	Underachievers	Same MA	Overachievers	Same GPA
Males	24.9%	***62.6%***	***74.8%***	36.2%**
Females	10.4%	32.0%***	***53.2%***	***15.8%
Sexes Combined	20.4%	***51.5%***	***62.6%***	**27.1%*

All four-group chi squares, $p < .001$.

Asterisks following a percentage is significance level for pair-wise comparison with Underachievers.

Asterisks preceding a percentage is significance level for pair-wise comparison with Selected Underachievers.

*, **, *** = $p < .05, .01, .001$, respectively.

Table 3. Divorce Rates by Sex and Achievement Group (Forms A and B)

	Underachievers	Same MA	Overachievers	Same GPA
Males	25.4%	+ 18.2%*	20.7%	17.5%+
Females	51.4%	***28.0%***	***18.9%***	**34.2%**
Combined Sexes	34.0%	***22.1%***	***19.6%***	*22.2%**

Four-group chi squares are $p < .10$ for males, $p < .001$ for females, $p < .001$ for combined-sex sample.

Asterisks following a percentage is significance level for pair-wise comparison with Underachievers.

Asterisks preceding a percentage is significance level for pair-wise comparisons with Selected Underachievers.

+, *, **, *** = $p < .10, .05, .01, .001$, respectively.

Cases of separation, death, and cohabitation are included in the total cases.

Figure 1

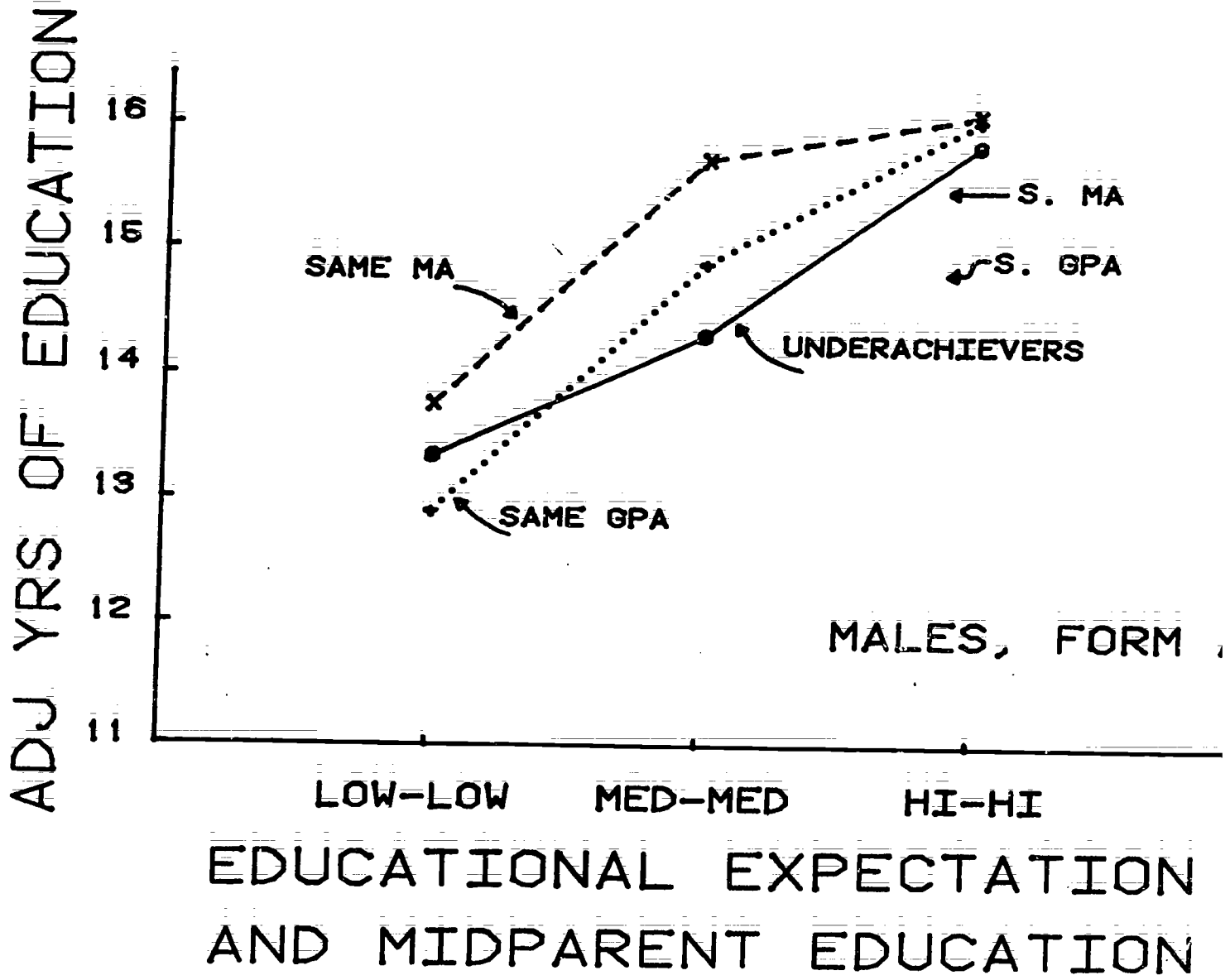


Figure 2

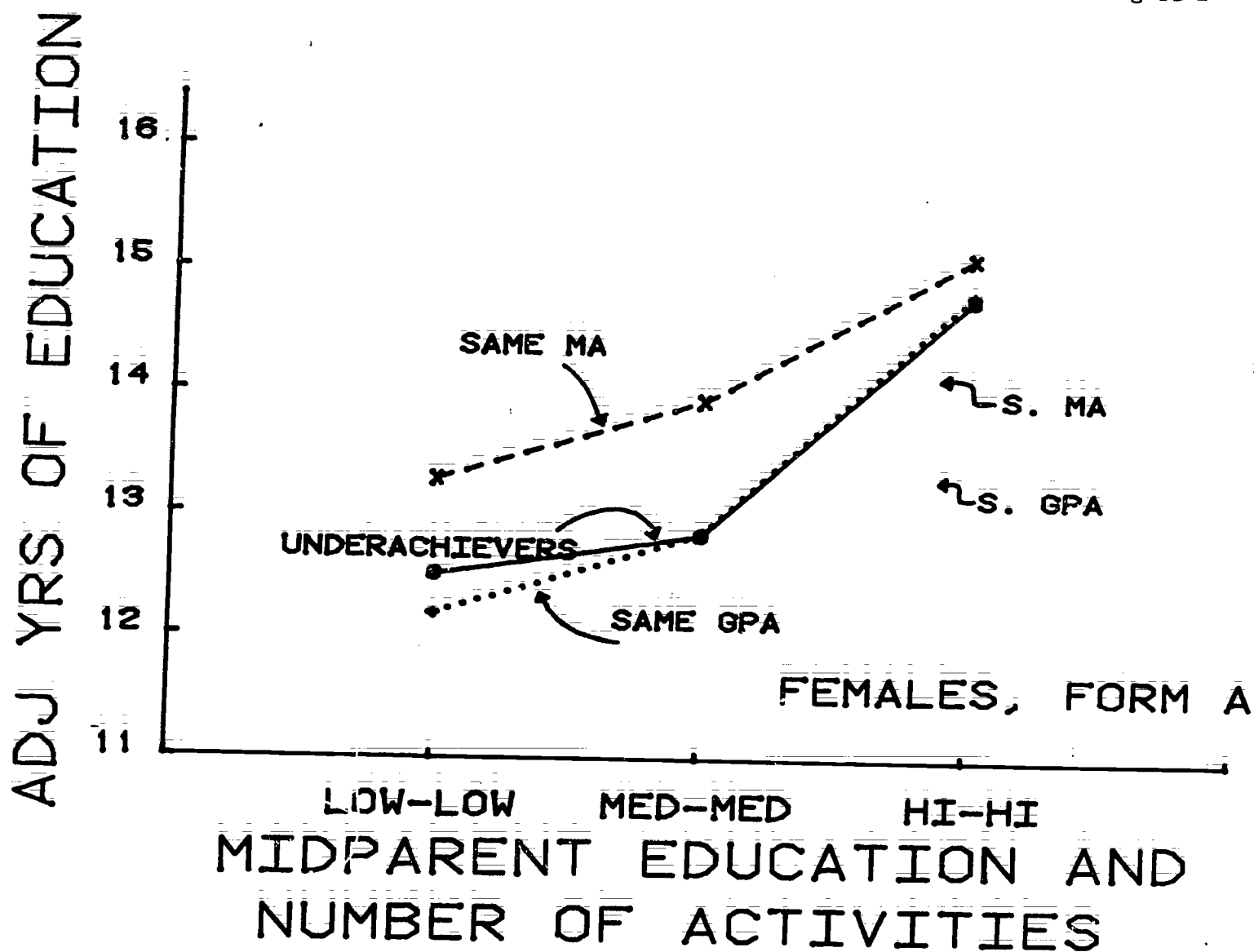


Figure 3

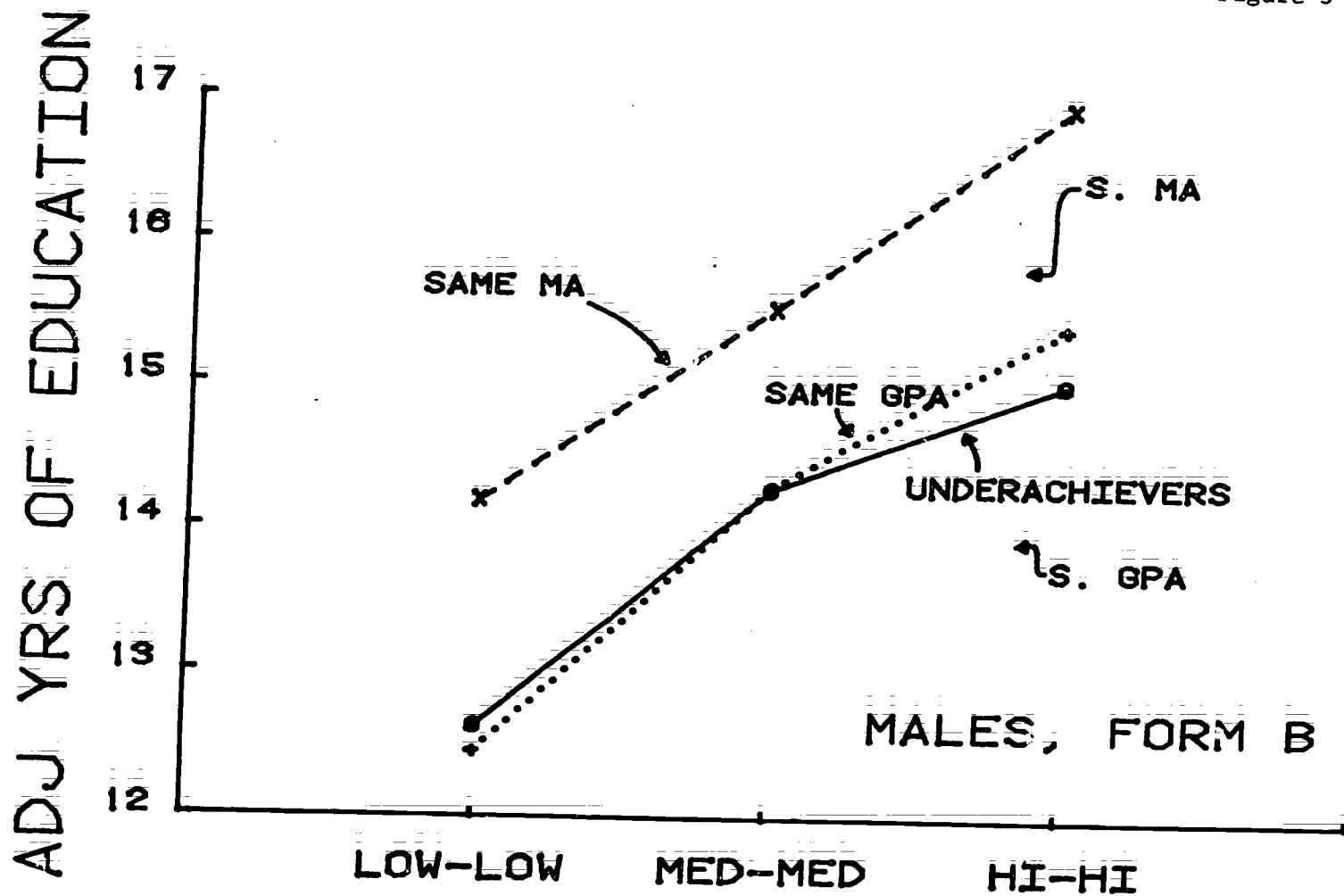


Figure 4

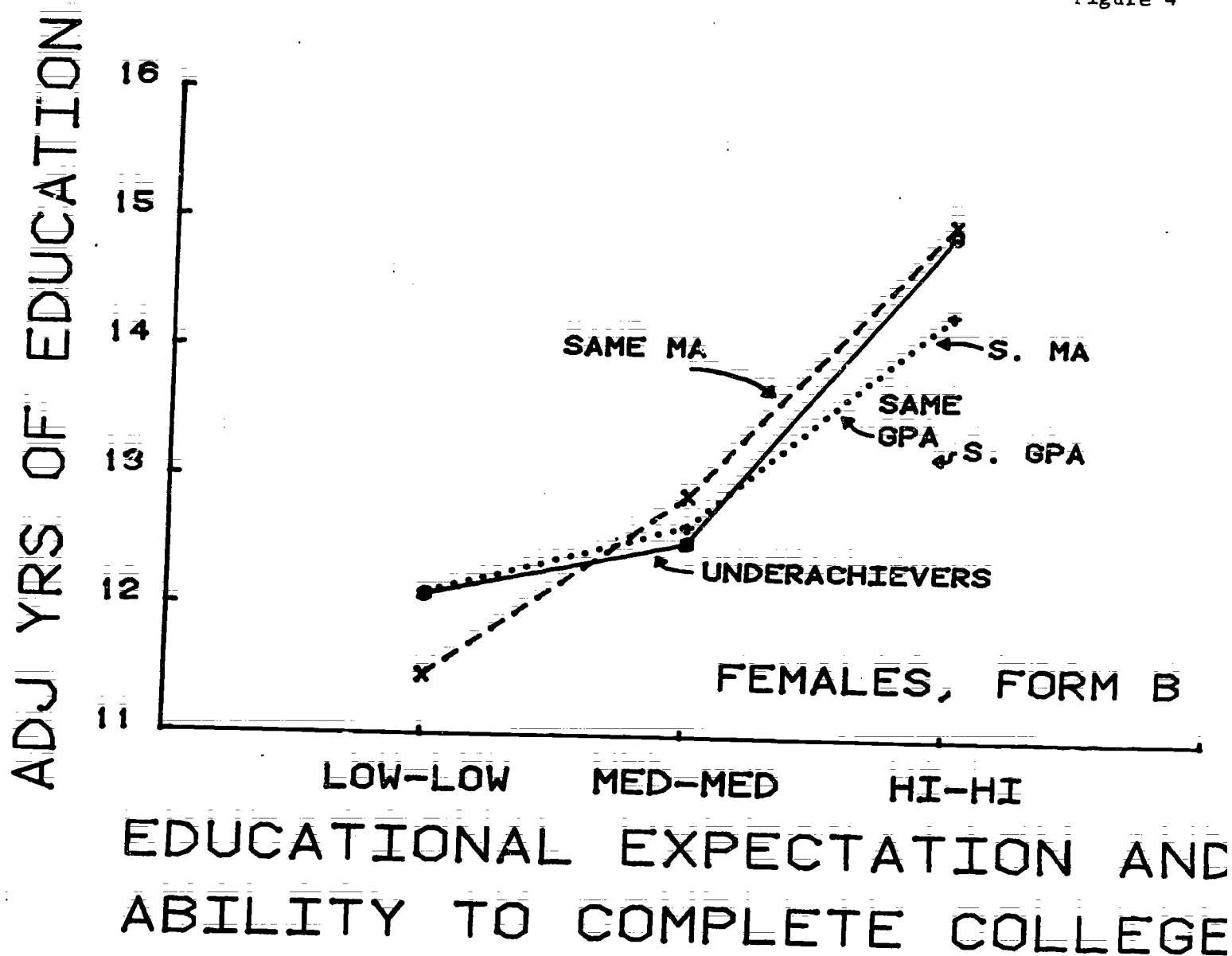


Figure 5

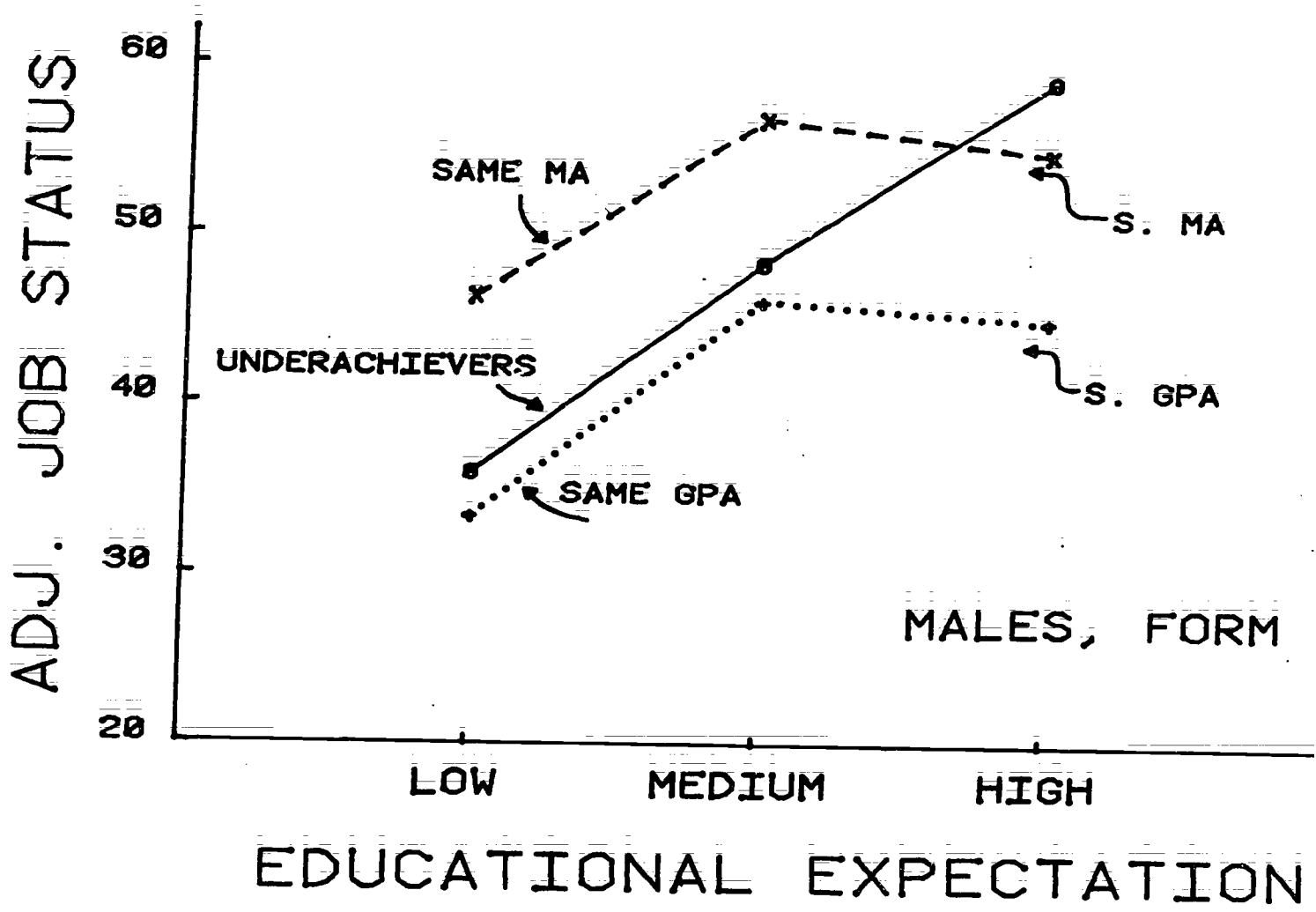
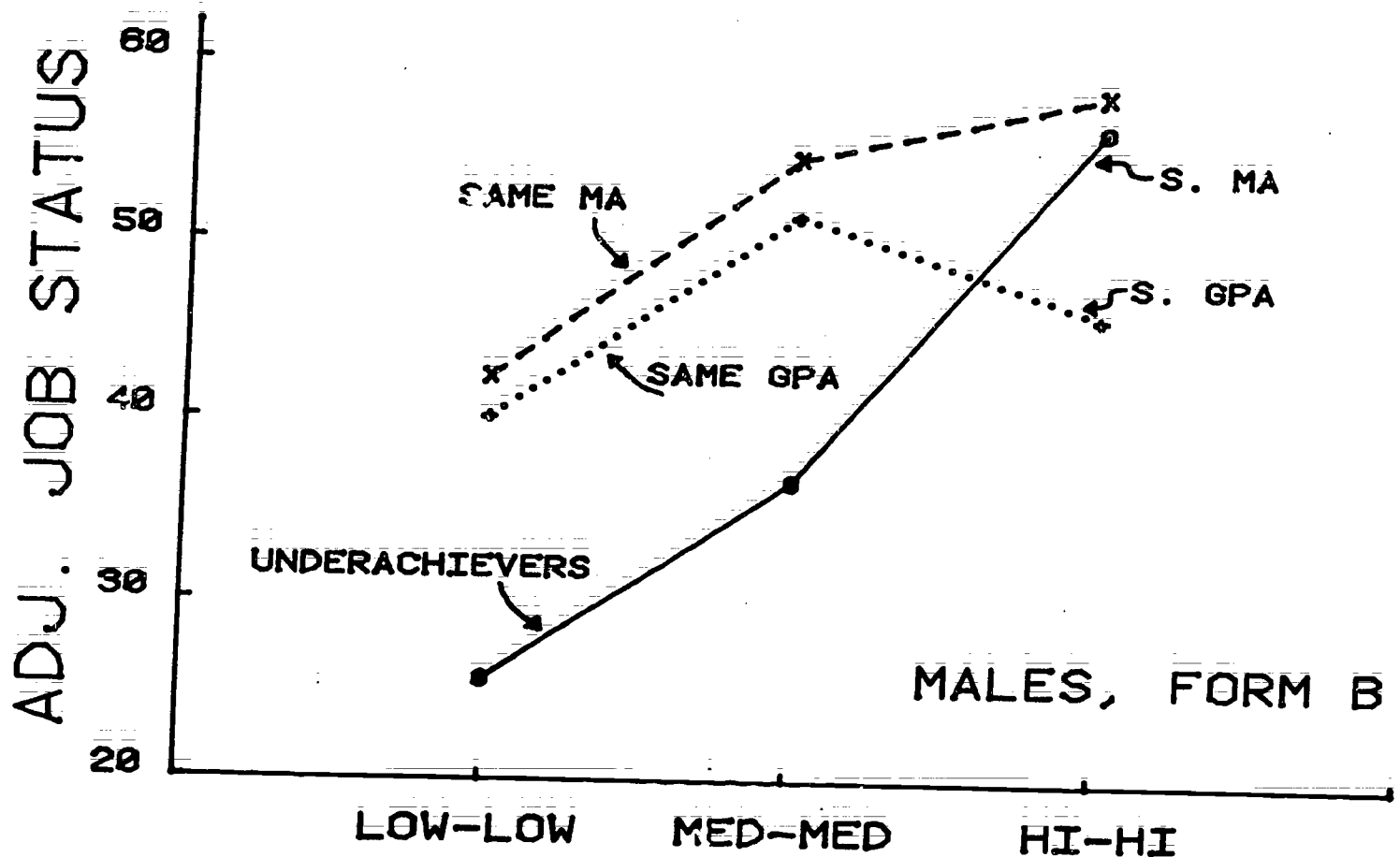


Figure 6



OCCUPATIONAL ASPIRATIONS
AND NUMBER OF ACTIVITIES

Figure 7

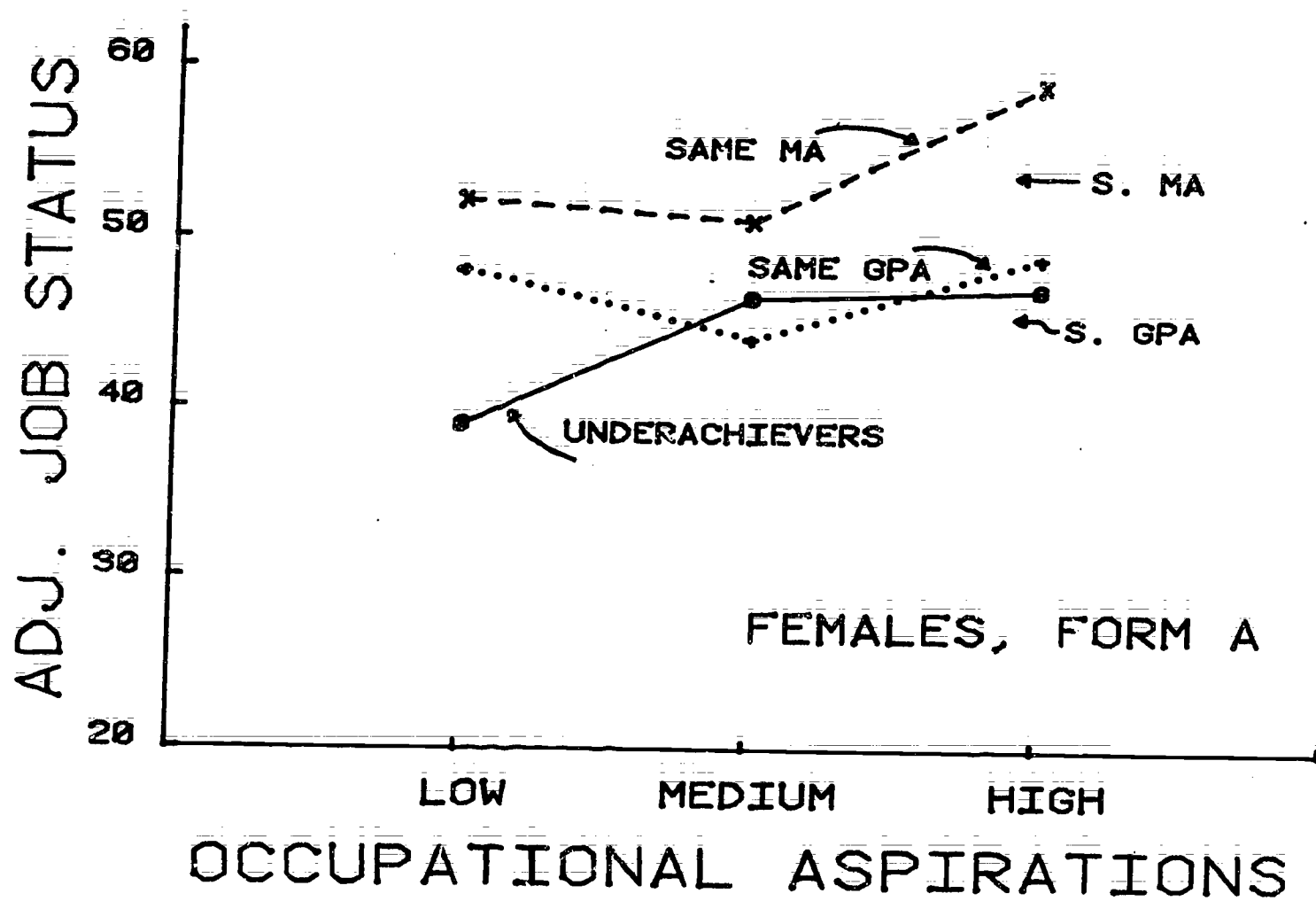


Figure 8

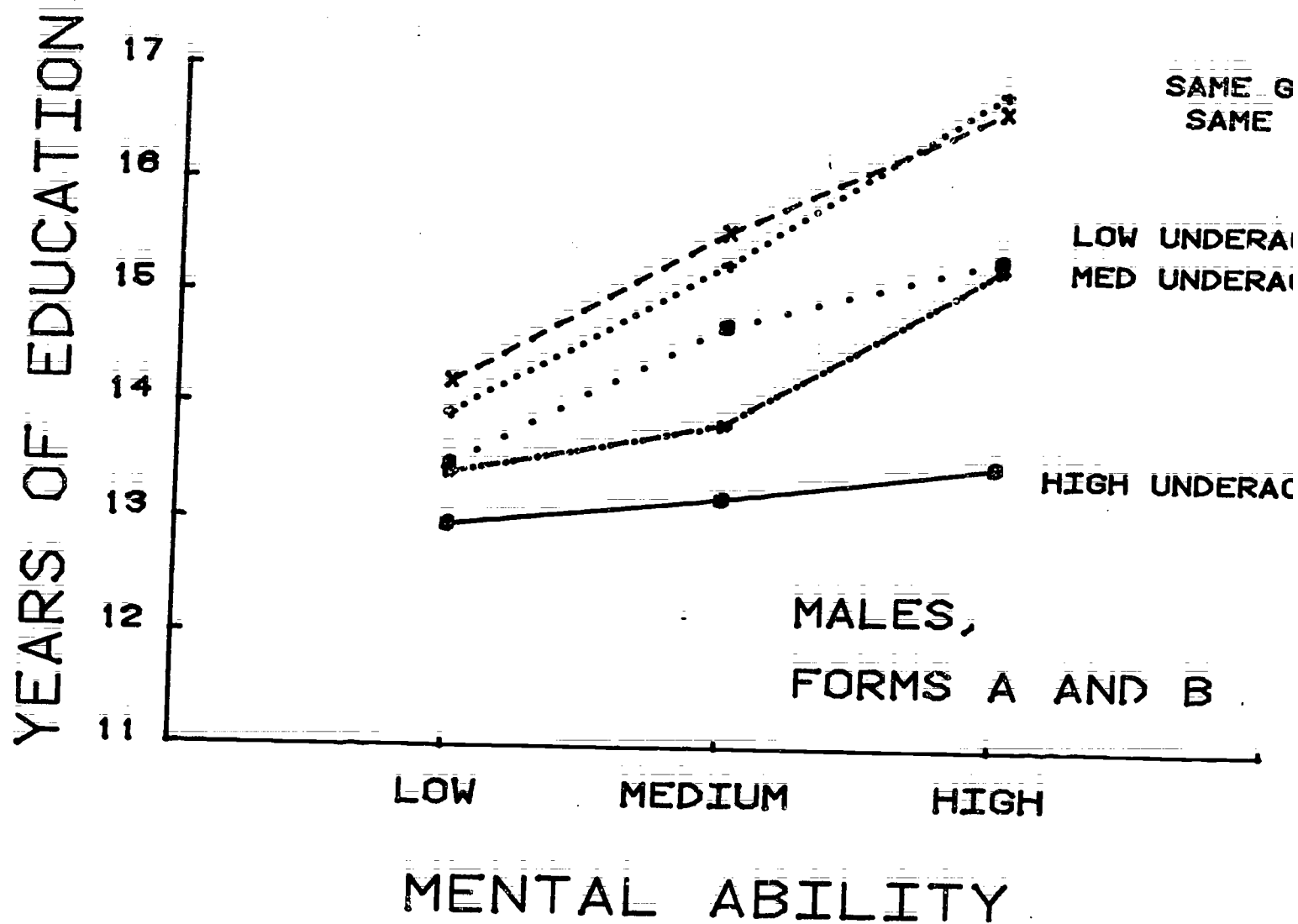


Figure 9

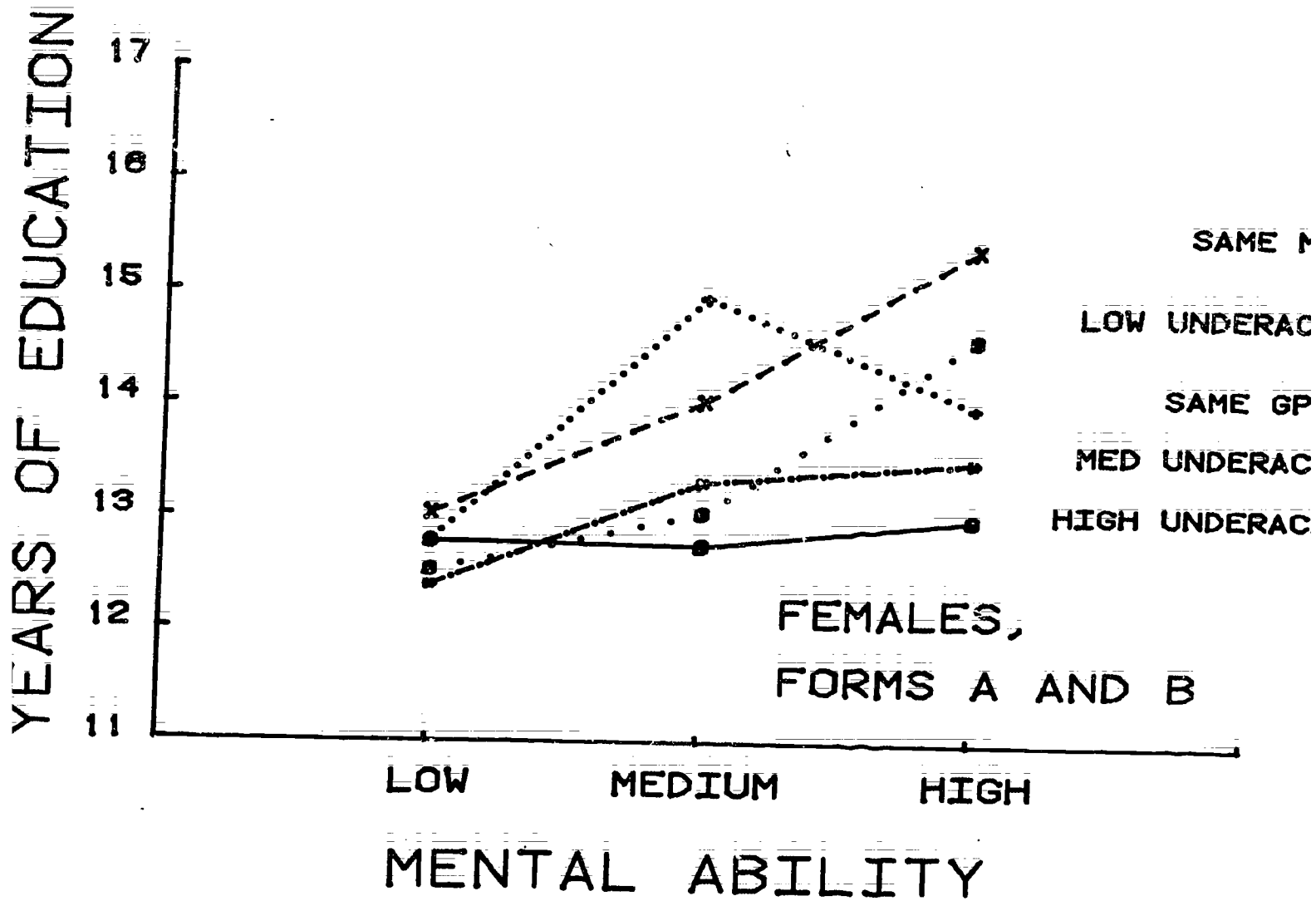


Figure 10

